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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PERKINS COIE LLP			EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/510,263

Applicant(s)

BADHEI ET AL.

Examiner

W. Wendy Kuo

Art Unit

2826

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 173-195 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 173-195 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/ISD)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 10/21/2008

DETAILED ACTION

1. Claims 173-195 are pending.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. **Claims 173-176, 178, 180-183, 185, 186, and 192-195 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer et al. (US 5,600,741) (hereinafter Hauer) in view of Gruenwald et al. (US 5,987,202) (hereinafter Gruenwald).**
5. **With respect to claim 173**, Hauer (e.g. Figure 1) teaches an integrated circuit, comprising:
 - A semiconductor substrate 11 having electrical circuitry coupled to an optoelectronic device 9 (column 4, lines 61-66) disposed on a first surface of the semiconductor substrate 11, the semiconductor substrate having a notch (3, 4)

extending from a second surface of the semiconductor substrate towards the first surface;

- Wherein the notch (3, 4) at least partially overlaps with the optoelectronic device 9 on the first surface;
- An optical reflector assembly disposed within the notch; wherein, the optical reflector assembly is physically configured for optical coupling with the optoelectronic device (column 6, lines 63-67 - column 7, lines 1-4)

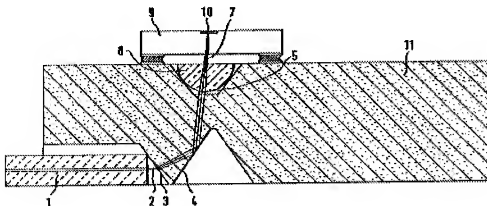


FIG. 1

Hauer fails to teach that the optical reflector assembly is **formed from a substrate**. Gruenwald teaches that an optical reflector assembly is formed from a substrate (Pyrex glass body) (column 5, lines 35-39) in order to provide a method for economical production of optical high-frequency transmitting and receiving modules (column 2, lines 9-12 and 52-56) by providing a desired mirror contour.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with the optical reflector assembly of Gruenwald formed from a substrate for the benefit of providing a method

for economical production of optical high-frequency transmitting and receiving modules by providing a desired mirror contour.

6. **With respect to claim 174**, Hauer (e.g. Figure 1) teaches an optical fiber 1 disposed on the second surface of the semiconductor substrate, the optical fiber having a core region.
7. **With respect to claim 175**, Hauer teaches that the optical reflector assembly is physically configured for optical coupling with the core region of the optical fiber.
8. **With respect to claim 176**, Hauer teaches that the optoelectronic device is one of a laser, a vertical-cavity surface-emitting laser, a photodiode, a waveguide, an array waveguide grating, and an optical amplifier (column 3, line 27).
9. **With respect to claim 178**, Hauer (e.g. Figure 1) teaches that the optoelectronic device is coupled to said semiconductor substrate via flip-chip mounting.
10. **With respect to claim 180**, Gruenwald teaches that the electrical circuitry comprises a metal trace to which the optoelectronic device is coupled (column 7, lines 44-56).
11. **With respect to claim 181**, Hauer teaches that the notch comprises an inclined surface; wherein, the inclined surface is inclined relative to the first surface and extends through at least the core region of the optical fiber.
12. **With respect to claim 182**, Gruenwald (e.g. Figure 7) teaches that the optical reflector assembly comprises at least one curved mirror ***disposed on the substrate*** (metallization) (column 7, lines 36-56).

13. **With respect to claim 183**, Gruenwald (e.g. Figure 7) teaches that the curved mirror is a spherical mirror.
14. **With respect to claim 185**, Gruenwald teaches that the substrate is a glass substrate (column 5, lines 35-39).
15. **With respect to claim 186**, Hauer as modified by Gruenwald teaches that the optical reflector assembly is coupled to the notch at the at least one inclined surface via an optical adhesive attaching the glass substrate to the at least one inclined surface (Gruenwald column 3, lines 1-4).
16. **With respect to claim 192**, Hauer teaches that the optoelectronic device is configured to operate with light of substantially the wavelength spectrum and the semiconductor substrate is absorbing for light of substantially the wavelength spectrum (column 4, lines 61-66).
17. **With respect to claim 193**, Hauer teaches that the semiconductor substrate has at least one opening 5 between the first surface and the notch, the opening at least partially overlaps with the optoelectronic device.
18. **With respect to claim 194**, Hauer teaches that the optical reflector assembly is physically configured for optical coupling the core region of optical fiber to the optoelectronic device.
19. **With respect to claim 195**, Gruenwald teaches that the substrate comprises of one or more of glass, silicon, and ceramic (column 5, lines 35-39).

20. Claims 177, 179, and 188-191 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer as modified by Gruenwald in view of Reedy et al. (US 6,869,229) (hereinafter Reedy).

21. With respect to claim 177, Hauer teaches all of the limitations of claim 173 above.

Hauer fails to explicitly teach that the optoelectronic device is coupled to said semiconductor substrate via solderable bumps. Reedy teaches that an optoelectronic device is coupled to a semiconductor substrate via solderable bumps (column 13, lines 1-14). Because both Hauer and Reedy teach flip-chip bonding an optoelectronic component to a semiconductor substrate, it would have been obvious to one of ordinary skill in the art at the time the invention was made to couple the optoelectronic device to the semiconductor substrate via solderable bumps as taught by Reedy to achieve the predictable result of electrically coupling an optoelectronic device to the semiconductor substrate.

22. With respect to claim 179, Hauer teaches all of the limitations of claim 173 above.

Hauer fails to teach that the notch is partially filled with an optically transparent adhesive. Reedy teaches that a notch is partially filled with an optically transparent adhesive in order to immobilize the fiber while minimizing light losses caused by reflection or absorption at interfaces (column 15, lines 20-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with the optically

transparent adhesive of Reedy for the benefit of immobilizing the fiber while minimizing light losses caused by reflection or absorption at interfaces.

23. **With respect to claim 188**, Hauer teaches all of the limitations of claim 173 above.

Hauer fails to teach that said **notch** is filled with epoxy; wherein the epoxy has a refractive index that is substantially similar to that of the core region of the optical fiber. Reedy teaches that an opening is filled with epoxy; wherein the epoxy has a refractive index that is substantially similar to that of the core region of the optical fiber in order to immobilize the fiber while minimizing light losses caused by reflection or absorption at interfaces (column 15, lines 20-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with the epoxy of Reedy for the benefit of immobilizing the fiber while minimizing light losses caused by reflection or absorption at interfaces.

24. **With respect to claim 189**, Hauer teaches all of the limitations of claim 175 above.

Hauer fails to teach that the semiconductor substrate comprises a first layer and a second layer, the first layer adjacent to the first surface; **and wherein the optoelectronic device is configured to operate with light of substantially a wavelength spectrum and the first layer is transparent for light of substantially the wavelength spectrum**. Reedy (e.g. Figures 1 and 2) teaches that a semiconductor substrate comprises a first layer and a second layer, the first layer adjacent to the first

surface; and wherein the optoelectronic device is configured to operate with light of substantially a wavelength spectrum and the first layer is transparent for light of substantially the wavelength spectrum in order to reduce the parasitic capacitance between charged active regions and the substrate and to eliminate leakage currents flowing between adjacent active devices (column 5, lines 54-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with the semiconductor substrate of Reedy having a first layer and a second layer for the benefit of reducing the parasitic capacitance between charged active regions and the substrate and eliminating leakage currents flowing between adjacent active devices.

25. **With respect to claim 190**, Hauer teaches that *the electrical circuitry has electronic components and optical waveguides* (column 1, lines 56-59).

26. **With respect to claim 191**, Gruenwald teaches that *the electrical circuitry comprises electrical signal processing circuitry* (column 4, lines 10-19).

27. **Claim 184 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer as modified by Gruenwald, and further in view of Won et al. (US 6,396,981) (hereinafter Won).**

28. **With respect to claim 184**, Hauer as modified by Gruenwald teaches all of the limitations of claim 182 above.

Hauer as modified by Gruenwald fails to teach that the optical reflector assembly further comprises a planar mirror ***disposed on the substrate***. Won (e.g. Figure 3) teaches that an optical reflector assembly 120 further comprises a planar mirror 127

disposed on the substrate in order to provide an optical device module with increased light coupling efficiency (column 3, lines 40-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer as modified by Gruenwald with the planar mirror or Won for the benefit of providing an optical device module with increased light coupling efficiency.

29. Claim 187 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer as modified by Gruenwald, and further in view of Reedy.

30. With respect to claim 187, Hauer as modified by Gruenwald teaches all of the limitations of claim 186 above.

Hauer as modified by Gruenwald fails to teach that the optical adhesive has a refractive index that is substantially similar to that of the core region of the optical fiber. Reedy teaches that an optical adhesive has a refractive index that is substantially similar to that of the core region of the optical fiber in order to minimize light losses caused by reflection or absorption at interfaces (column 15, lines 20-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer as modified by Gruenwald with the optical adhesive of Reedy for the benefit of minimizing light losses caused by reflection or absorption at interfaces.

Response to Arguments

31. Applicant's arguments with respect to claim 173 and its dependencies have been considered but are moot in view of the new ground(s) of rejection.

32. It is respectfully noted that in the previous Office action (dated 09/29/2008), official notice was taken for the rejection of claim 180. Since the applicant has not traversed the examiner's assertion of official notice, the statement that it is well-known to use metal for the conductive trace (see Office action at page 5) is taken to be admitted prior art (MPEP 2144.03C).

Conclusion

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Wendy Kuo whose telephone number is (571)270-1859. The examiner can normally be reached Monday through Friday 7:00 AM to 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue A. Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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